

P. 4123 v. 1274

ZANZIBAR PROTECTORATE.

MEDICAL AND PUBLIC HEALTH REPORTS

FOR THE YEAR

1915.

ZANZIBAR:

PRINTED BY THE GOVERNMENT PRINTER.

1916.

9305

CONTENTS.

	PAGE.
MEDICAL DIVISION, ZANZIBAR	1
MEDICAL AND PUBLIC HEALTH DIVISIONS, PEMBA	14
PUBLIC HEALTH DIVISION, ZANZIBAR AND PEMBA.	19
SPECIAL REPORTS ON:—	
(I) FILARIASIS (HUMAN)	32
(II) TRYPANOSOMIASIS (CATTLE)	33
VETERINARY DIVISION AND ECONOMIC ZOOLOGY	39



Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

<https://archive.org/details/b31479625>

ZANZIBAR PROTECTORATE.

REPORT ON THE MEDICAL DIVISION FOR THE YEAR 1915.

ZANZIBAR.

EUROPEANS.

General.—The health of the European Community both civil and official has on the whole been satisfactory.

Two European children were born in Zanzibar of Portuguese and Jewish nationalities.

Deaths amongst Europeans in Zanzibar numbered two, neither were residents proper, the causes of death were shell wound and small-pox respectively.

Common Ailments.—Digestive, and specially hepatic disorders, catarrhal conditions from chill, mild malarial fever, rheumatism, and manifestations of neurasthenia.

During May, June and July a considerable number of cases of Dengue Fever occurred throughout the town, a few cases in mild form but typical amongst Europeans. The occurrence was noteworthy as over twenty years had elapsed since Dengue Fever in Zanzibar had shown itself in anything approaching epidemic dimensions.

Invaliding of Officials.—Two officials were invalidated during the year the causes being hepatitis following dysentery and asthma with cardiac lesion.

Hospital for Europeans.—In spite of the numerous objectionable features of the dilapidated, rambling building which is still utilized as a temporary European Hospital it has throughout the year served a useful purpose for the lack of other accommodation. The impossibility of converting an old Arab house to meet the requirements of a modern hospital, the waste of time and labour involved in conducting it and attempting to keep it clean, the excessive cost of procuring adequate lighting and ventilation, and the annually increasing bill for unsatisfactory patching and repairing have been referred to in the last two annual Reports.

The sum of money which the Public Works Department has already spent on this building in the last four years would amply have justified the building of a properly designed permanent hospital affording the same accommodation, instead, it has been wasteful outlay on a building which can never under any circumstances be adapted to hospital requirements.

As compared to 122 in-patients during 1914 there were 335 admitted during 1915. Of these 291 were men from ships of H.B.M's. Navy serving in these waters and throughout the year a Naval Surgeon and certain Sick Birth Ratings were detailed as additions to the depleted shore staff. Chronic cases and certain convalescents were shipped to Simons Town whenever opportunity occurred.

By the close of the year preparations had been completed for the accommodation, in the case of emergency, of 11 1st. and 55 2nd Class patients.

CASES TREATED.

Months		Government	Non Government	Navy and Army	Total
January	...	1	2	25	28
February	...	2	1	17	20
March	...	6	3	15	24
April	...	...	1	24	25
May	...	2	3	29	34
June	...	1	1	29	31
July	...	4	2	31	37
August	...	1	1	25	27
September	...	...	3	23	26
October	...	...	...	26	26
November	...	...	1	25	26
December	...	1	2	28	31
Total		18	20	297	335

The 335 cases treated were of the following races and sexes.

		Males	Females
Europeans	...	330	2
Asiatic	...	...	3

Diseases Treated.—Table I. includes the return of diseases and deaths (in-patients) for the year for the European Hospital.

The single fatality was from shell wound. Many of the diseases were unusual amongst the more or less selected lives normally stationed in the Tropics and occurred amongst men of H. B. M's. Navy and Naval Reserves of whom many, both as regards age and general health, would normally have been disqualified for tropical duty.

The following diseases perhaps call for some comment.

Beri Beri.—6 cases. All occurred amongst crews of ships employed in the blockade of German East African Coast and all were invalidated.

Malaria, 49 cases. *Blackwater Fever*, 1. *Undefined Fever*, 25 cases. The great majority of these cases occurred amongst sailors who, stationed in isolated plantation districts, were careless with regard to mosquito nets and prophylactic quinine. The case of Blackwater Fever was a sailor off H. M. S. "Challenger" who had contracted malaria in the Cameroons.

Dysentery 5 cases, *Enteritis* 6 cases. No case of amoebic dysentery was found and these cases were mainly referable to contaminated food.

Hepatitis.—9 cases, none were amoebic and no case of abscess occurred.

SUBORDINATE OFFICIALS.

The health of Subordinates has on the whole been satisfactory. Admissions to Hospital numbered 82 which included the following conditions mainly referable to the tropics:—

Malaria	...	...	...	25
Undefined Fever	...	...	...	15
Blackwater Fever	...	...	...	2
Dengue Fever	...	...	...	1

NATIVES.

Common Diseases.—Ulcers, rheumatism, bronchial troubles, venereal diseases, malarial and filarial affections and ankylostomiasis predominate.

The apparent increasing distribution of Ankylostomiasis throughout the Protectorate has been referred to in previous reports and there is no reason to consider that its serious proportions have diminished nor to modify the opinion that so soon as possible combined action by Medical and Public Health Divisions should be taken to combat it.

GOVERNMENT HOSPITAL FOR NATIVES AND SUBORDINATES.

The number of in-patients was 1171, as compared with 1131 for 1914, and 53 deaths as compared to 62 in 1914.

Out-patients numbered 8398 a diminution of 1111 from the figures for the previous year. The following table shows the figures for the last 5 years.

Years	In-patients	Deaths	Out-patients
1911	1282	62	6910
1912	1230	50	7179
1913	1503	52	9087
1914	1131	62	9509
1915	1171	53	8398

During the year only 66 operations were performed under general anaesthesia as compared to 232 and 148 in the two previous years.

Table I includes the diseases and deaths for both In and Out-patients for the year for Natives' and Subordinates' Hospital, Zanzibar, Chake Chake Hospital, Pemba and all District Dispensaries.

In the last Annual Report a special comment was made on the diseases which are most rife in the Protectorate. The following perhaps call for special note.

INFECTIVE DISEASES.

Beri-Beri.—6 in-patients: 3 were Chinamen, from a small community occupied in *beche de mer* fishing in the North of Pemba, 3 were Africans, a seedy boy off H. M. S. "Goliath", a Swahili policeman from Mkokotoni, and a Swahili prisoner from Kilimani Central Gaol.

The reduction in number of cases amongst prisoners and the general native population as compared to a few years ago is very marked.

Dengue.—4 in-patients. A considerable epidemic occurred during the months of May, June and July such as had not occurred for over 20 years, of a mild form mainly confined to Indian Bazaars.

Dysentery.—5 in-patients with one death, 11 out-patients.

Gonorrhoea.—37 in-patients and 386 out-patients; *Urethritis*, 2 in-patients, 1 death and 57 out-patients.

The disease is rife amongst natives of both sexes and all ages and is undoubtedly an important factor in the lowness of the native birth rate.

Malaria and Undefined Fever.—Malaria, 269 in-patients with 2 deaths, out-patients 917; Undefined Fever 88 in-patients 658 out-patients.

Blackwater Fever.—8 in-patients, with one death, and 2 out-patients.

The 6 cases which occurred in Zanzibar were amongst the following: an Indian Sub-Assistant Surgeon stationed at Ziwani Military Lines, a Goan Clerk stationed at Mkoani, Pemba, an Indian Warder living in Zanzibar town but on duty at Kilimani Central Gaol, two Indian Light house Keepers from Mwana Mwana Island (one of these, admitted twice, died).

Pellagra.—1 in-patient who died. The first case recorded in this Protectorate. A Native from German East Africa, he lived some months in Mwera district and developed typical eruption, physical and mental symptoms soon after admission to Kilimani Central Gaol.

Plague.—1 in-patient who died. The wife of a Goanese Clerk living in Zanzibar town.

Pneumonia.—15 in-patients with 5 deaths and 6 out-patients.

Syphilis.—380 cases are recorded under this heading.

Tuberculosis.—27 in-patients with 6 deaths, 41 out-patients.

GENERAL DISEASES.

Anaemia.—648 cases with 4 deaths.

LOCAL DISEASES.

Hepatitis Acute.—10 in-patients with 2 deaths, 324 out-patients, included are many cases of hepatic congestion.

Hepatic Abscess.—No case occurred.

Splenitis.—252 cases.

Filarial Lymphangitis, Elephantiasis, and Filariasis.—24 in-patients and 298 out-patients.

Haematuria.—11 in-patients, and 148 out-patients are recorded.

Ankylostomiasis.—80 in-patients with 10 deaths, 188 out-patients.

Asthma.—10 in-patients, 321 out-patients.

ZIWANI MILITARY LINES.

The health of the Native Troops as compared to previous years was excellent, the reason probably being that throughout the year by far the greater number of the men were locally recruited and hence possessed considerable immunity towards malaria and a knowledge of local foods and fruits, whereas in previous years the native troops have always been of mainland up-country tribes.

The following table shows the number of patients admitted to hospital as in-patients for "all diseases", malaria, and dysenteric diarrhoea and the deaths as compared to the figures for the two previous years..

Year	Average Complement of men.	All Diseases	Deaths	Malaria	Dysenteric Diarrhoea
1913	200 (about)	362	...	132	7
1914	155	185	2	50	8
1915	204	58	3	15	1

The 3 deaths recorded were due to Pneumonia (2) and Intestinal Obstruction.

DISPENSARIES

The number of patients utilizing these Government Plantation Dispensaries is satisfactory. It is hoped that in the near future other dispensaries may be established in selected thickly populated areas of both islands.

MKOKOTONI.

Year	In-patients	Out-patients	Total
1910	...	870	870
1911	27	1328	1355
1912	51	2252	2303
1913	49	2338	2387
1914	45	2526	2571
1915	79	2147	2226

CHWAKA.

1910	...	1261	1261
1911	...	1142	1142
1912	...	1380	1380
1913	9	1085	1094
1914	15	1135	1094
1915	11	1739	1750

The returns from these Dispensaries are included in Table I.

ASYLUM FOR INSANE NATIVES.

Criminal and pauper insane persons have still been housed throughout the year in the old "Barracks" until such time as the promised new Asylum is erected.

21 insane persons (15 males and 6 females) were admitted as compared to 12 during 1914.

	Remaining at end of year	Admitted during 1915	Discharged	Deaths	Remaining at end of 1915
Males ...	...	15	9	2	4
Females ...	2	6	5	2	1
Total ...	2	21	14	4	5

KILIMANI CENTRAL GAOL.

The cleanliness and good order in this prison have been maintained.

Prisoners medically examined on admission to Gaol numbered 666 (605 males and 61 females) as compared to 913 for 1914.

The following numbers of prisoners were treated:—

Year	Out-patients	In-patients
1914	842	152
1915	481	111

Amongst patients treated in the Prisoner's Ward there occurred 13 deaths, as compared to 15 in 1914, from the following causes:—

Ankylostomiasis	... 5
Hepatic Cirrhosis	... 1
Dysentery	... 1
Diarrhoea	... 1
Syphilis	... 1
Phthisis pulmonalis	... 1
Nephritis	... 1
Pellagra	... 1
Debility	... 1
	13

STAFF.

Dr. MacDonald, Principal Medical Officer, proceeded on privilege leave on 6th May and retired on 22nd November after over nineteen years service.

Dr. Carment, Assistant Medical Officer of Health, acted as P. M. O. from 15th March to 30th April.

Dr. Curwen, Senior Medical Officer, was re-called from privilege leave arriving on 20th April, was appointed Acting P. M. O. on 1st May and promoted P. M. O. on 23rd November.

Dr. de Souza, Medical Officer, proceeded on privilege leave on 20th March returning to duty on 13th September.

Dr. Watkins, Medical Officer, completed the period of his temporary appointment on 26th January.

Dr. Shepherd, Medical Officer on probation was invalidated home on 20th March and out of the service in October.

Dr. Bolton arrived on 23rd January on probationary appointment and resigned on 20th March.

Dr. Waller arrived on 22nd June on probationary appointment.

Dr. Copland was temporarily employed at the Natives' and Subordinates' Hospital from 27th March to 24th October.

Mrs. Zurcher, Matron, was on duty in Zanzibar throughout the year.

Miss Taylor, Nursing Sister, stationed at Chake Chake Hospital Pemba, was absent on privilege leave from 26th January to 18th July.

Miss Brewerton, Nursing Sister, was in charge of temporary European Hospital until proceeding on leave on 16th July.

Miss Chambers, Nursing Sister, was stationed at Natives' and Subordinates' Hospital throughout the year.

Miss Marson, Nursing Sister, was stationed in Pemba during the first half of the year and at Natives' and Subordinates' Hospital latterly.

Miss Hoare, Nursing Sister, was stationed at temporary European Hospital acting Sister-in-Charge from 5th July.

Miss MacTurk, appointed on 9th January resigned on 29th March.

Miss Manson, appointed Nursing Sister on 14th July was stationed at temporary European Hospital.

Miss Dickerson, was appointed temporarily for the duration of the war on 14th August and stationed at temporary European Hospital.

Sub-Assistant Surgeon Joshi was absent with the Expeditionary Force in East Africa throughout the year.

Sub-Assistant Surgeon Washekar was stationed at Ziwani Military Lines with additional charge of out-patients in the Kilimani Central Goal.

The work of Compounders stationed at Natives' and Subordinates' Hospital and the Plantation Dispensaries has been satisfactory.

As Clerk and Store Keeper of the Central Medical Store, Mr. Martin's duties single handed exceed his capabilities in spite of indefatigable energy.

The work of the staff owing to depletion in numbers and additional duties arising out of the state of war has been heavy throughout the year. At one period only one Medical Officer was on duty out of a full complement of five and at the close of the year there still remained two vacancies.

With the filling of the post of Principal Medical Officer in November it was ruled that that office should not only carry the duties of head of the Medical Department but general direction over both Medical and Public Health Divisions. It is believed that this arrangement will prove of undoubted benefit by relieving the Medical Officer of Health of much administrative and office work and so

permitting him to extend his practical activities throughout the Protectorate, by bringing the Medical Officers of the two Divisions more closely together in work and aims which are only artificially separable, and by utilizing in the evolution of schemes for the Public Health that more intimate knowledge of different castes, customs and conditions possessed by officers of the Medical Division working amongst this cosmopolitan population.

FINANCIAL. MEDICAL DIVISION.

Statement of Expenditure and Revenue for the Year 1915.

Details	Estimated Expenditure 1915						Actual Expenditure 1915					
	Rs.	Cts.	£	s.	d.	Rs.	Cts	£	s.	d.		
MEDICAL.												
Personal Emoluments	94,006	0	6,267	0	0	87,203	41	5,713	11	3		
<i>Other Charges.</i>												
Contingencies	1,175	0	78	0	0	413	16	27	10	10		
Fuel and Light	4,750	0	317	0	0	4,904	92	326	19	11		
Maintenance of Hospitals	22,550	0	1,503	0	0	29,845	79	1989	14	4		
Medical and Surgical Stores	14,500	0	967	0	0	13,970	13	931	6	10		
Passages	15,400	0	1,027	0	0	9,283	88	618	18	6		
Travelling Expenses	900	0	60	0	0	299	85	19	19	10		
	153,281	0	10,219	0	0	145,921	14	9,728	1	6		
Special Expenditure: X Ray apparatus	...	...	...	...	.....	3,088	87	205	18	6		
Total Expenditure	...	...	...	...	.....	149,010	01	9,934	0	0		

Details	Estimated Revenue 1915						Actual Revenue 1915					
	Rs.	Cts.	£	s.	d.	Rs.	Cts.	£	s.	d.		
Hospital charges from European and Native Hospitals, sale of Drugs, etc.	5,500	0	367	0	0	22,127	59	1,475	3	5		
Total Revenue	...	...	...	...	.....	22,127	59	1,475	3	5		

H. CURWEN,
Principal Medical Officer.

Zanzibar, 26th June, 1916.

TABLE I.

 Return of Diseases and Deaths for the Year 1915
 for the Protectorate.

Diseases	Europeans		Natives		
	Zanzibar		Zanzibar and Pemba		Out-patients
	In-patients		In-patients		
	Admissions	Deaths	Admissions	Deaths	Total
INFECTIVE DISEASES					
Beri-Beri	..	6	..	6	2
Dengue	..	1	..	4	1
Dysentery	..	5	..	5	11
Erysipelas	1
Gonorrhoea	37	386
Influenza	..	2	..	..	2
Leprosy	1
Malaria (a) Benign Tertian	..	49	..	266	799
(b) Quartan	3	115
(c) Chronic Malaria	3
(d) Blackwater Fever	..	1	..	8	2
Measles	4
Pellagra	1	..
Plague	1	1
Pneumonia	15	5
Septicaemia	1	2
Syphilis (a) Primary	..	7	..	20	126
(b) Secondary	..	2	..	..	136
(c) Tertiary	5	92
(e) Inherited	1
Small-pox	..	1	..	..	..
Tuberculosis	..	7	..	27	6
Whooping Cough	1	7
Tetanus	1	..
Yaws	1
Undefined Fever	..	25	..	88	658
Mumps	3
Rheumatism, Acute	..	2	..	..	..
Other Diseases	1	28
INTOXICATIONS					
Alcoholism	..	4	..	..	4
Morphinism	1
Other Diseases	1	8
GENERAL DISEASES					
Anæmia	29	4
Diabetes	1	39
Gout	..	1	..	2	2
Debility	41	2
Rickets	1
Rheumatism, Chronic	..	7	..	48	807
Other Diseases	7	87
LOCAL DISEASES					
<i>Diseases of the Nervous System</i>					
Sub-Section 1					
Neuritis	2	..
Myelitis	2	..
Congestion of Brain	1	..
Other Diseases	..	4	..	2	2
Sub-Section 2					
Apoplexy	1	..
Paralysis	..	2	..	9	1
	Carried forward	126	..	636	26
					4518

TABLE I—*continued.*Return of Diseases and Deaths for the Year 1915
for the Protectorate.

Diseases	Europeans		Natives			Total			
	Zanzibar		Zanzibar and Pemba		Out-patients				
	In-patients		In-patients						
	Admissions	Deaths	Admissions	Deaths					
Brought forward ..	126	..	636	26		4518			
LOCAL DISEASES—(contd.)									
Epilepsy ..	3	..	3	1		13			
Neuralgia ..	3	..	3	..		126			
Hysteria ..	1	..	1	..		1			
Vertigo ..	..	..	..	..		69
Other Diseases ..	3	..	9	..		4			
Sub-Section 3									
Mental Diseases									
Idiocy ..	..	..	2	..		3	
Melancholia ..	2	..	..	..		..
Dementia ..	..	..	1	..		2	
Delusional Insanity ..	..	..	3	1		6	
Diseases of the Eye									
Blepharitis ..	..	..	9	..		87	
Conjunctivitis ..	2	..	20	..		312			
Keratitis ..	..	..	1	..		2	
Ulceration of Cornea ..	9	..	9	..		18			
Iritis ..	..	..	2	..		16	
Optic Neuritis ..	..	..	..	..		1
Cataract ..	..	..	..	..		13
Other Diseases ..	2	..	9	..		69			
Diseases of the Ear									
Inflammation ..	4	..	..	..		112
Other Diseases ..	..	..	..	..		83
Diseases of the Nose									
Coryza ..	3	..	7	..		107			
Other Diseases ..	..	..	..	..		47
Diseases of the Circulatory System									
Endocarditis ..	2	..	1	1		4			
Valvular, Mitral ..	2	..	6	3		20			
Tricuspid ..	..	..	..	..		1
Pulmonary ..	..	..	..	..		4
Aortic ..	1	..	..	..		..
Arterio-sclerosis ..	..	..	..	..		4
Aneurism ..	1	..	..	..		1
Other Diseases ..	4	..	7	..		36			
Diseases of the Respiratory System									
Laryngitis ..	..	..	1	..		92	
Bronchitis ..	..	..	37	2		1158	
Broncho-pneumonia ..	..	..	2	..		8	
Pleurisy ..	2	..	4	1		7			
Asthma ..	2	..	10	..		321			
Empyema ..	..	..	..	..		1
Other Diseases ..	..	..	1	..		23	
Diseases of the Digestive System									
Stomatitis ..	..	..	..	..		62
Caries teeth ..	1	..	2	..		694			
Glossitis ..	..	..	..	..		1
Pharyngitis ..	..	..	1	..		76	
Dilatation of Stomach ..	..	..	..	..		10
Carried forward ..	173	..	787	35		8132			

TABLE I—*continued.*Return of Diseases and Deaths for the Year 1915
for the Protectorate.

Diseases	Europeans		Natives			
	Zanzibar		Zanzibar and Pemba		Out-patients	
	In-patients		In-patients			
	Admissions	Deaths	Admissions	Deaths	Total	
Brought forward	..	169	..	787	35	8132
LOCAL DISEASES—(contd.)						
Hæmatemesis	1	..	2
Tonsillitis	4	3	..	122
Gastritis	2	3	..	103
Enteritis	8	2	..	3
Dyspepsia	4	5	..	319
Appendicitis	1	2	..	3
Colitis	2
Hernia	1	21	2	62
Diarrhœa	1	21	4	95
Constipation	4	12	..	2077
Colic	10	..	249
Hæmorrhoids	6	6	..	31
Hepatitis, Acute	9	10	2	324
Cirrhosis	1	1	..
Jaundice	1	2	1	7
Ascites	7	1	14
Other Diseases	3	3	1	5
<i>Diseases of the Lymphatic System</i>						
Splenitis	9	..	243
Inflammation of Lymphatic Gland	..	5	..	18	..	95
Suppuration of do.	..	2	..	8	..	18
Lymphangitis	3	..	143
do. Filarial	12	..	105
Other Diseases	9	..	16
<i>Diseases of the Urinary System</i>						
Nephritis, Acute	1	1	..	1
Nephritis, Chronic	5	3	2
Renal Colic	11
Cystitis	6	..	120
Hæmaturia	11	..	148
Chyluria	2
Other Diseases	2	..	15
<i>Diseases of the Generative System</i>						
(Male Organs)						
Urethritis, Acute	8	..	..	51
Urethritis, Chronic	2	1	6
Stricture	1	9	1	38
Soft Chancre	6	14	..	189
Condyloma	1	..	15
Hydrocele	1	17	..	146
Orchitis	2	14	..	90
Epididymitis	16
Abscess of Testicle	4
Other Diseases	11	53	..	64
(Female Organs)						
Ovaritis	11
Ovarian Cyst.	3	1	3
Endometritis	8
Displacement of Uterus	1
Carried forward	..	257	..	1093	53	13111

TABLE I—*continued.*Return of Diseases and Deaths for the Year 1915
in the Protectorate.

Diseases		Europeans		Natives		
		Zanzibar		Zanzibar and Pemba		Out-patients
		In-patients		In-patients		
		Admissions	Deaths	Admissions	Deaths	Total
Brought forward	..	257	..	1093	53	13111
Amenorrhœa	..	..	..	..	..	6
Dysmenorrhœa	..	..	..	2	..	4
Leucorrhœa	..	..	..	1	..	2
Mastitis	..	..	..	..	..	2
(Confinement)	..	..	1	..	..	..
Abscess of Breast	..	..	..	2	..	1
Other Diseases	..	..	..	1	..	7
<i>Diseases of the Organs of Locomotion</i>						
Osteitis	..	..	1	..	1	6
Arthritis	..	..	1	..	3	53
Synovitis	..	..	..	2	..	34
Myalgia	..	..	1	..	2	13
Other Diseases	..	..	1	..	14	24
<i>Diseases of Connective Tissue</i>						
Cellulitis	..	..	3	..	11	27
Abscess	..	..	5	..	62	223
Elephantiasis	..	..	..	11	..	136
Other Diseases	..	..	2	..	3	26
<i>Diseases of the Skin</i>						
Urticaria	..	..	..	..	..	6
Eczema	..	..	2	..	3	83
Boils	..	..	11	..	3	149
Carbuncle	..	..	2	..	1	11
Herpes	..	..	..	..	..	9
Psoriasis	..	..	..	1	..	29
Tinea	..	..	..	1	..	112
Tinea Cruris	..	..	..	..	..	73
Scabies	..	..	..	2	..	810
Prickly Heat	..	..	..	..	..	2
Ulcers	..	..	12	..	150	1
Other Diseases	..	..	1	..	7	2444
Other Diseases	..	..	..	..	..	18
<i>INJURIES</i>						
General	..	..	..	..	5	225
Local	..	..	42	1	201	12
Tumours, Simple	..	..	1	..	13	..
Tumours Malignant	..	..	..	..	1	..
Poisons (Snake bite)	..	..	..	..	1	..
Other Diseases	..	..	..	..	8	3
Parasites:—Animal	..	..	..	..	..	6
Protozoa	..	..	..	..	..	2
Other Diseases	..	..	..	..	..	1
Ascaris	..	..	..	..	2	2
Filariasis	..	..	..	..	1	19
Ankylostomiasis	..	..	..	..	1	57
Other Diseases	..	..	..	..	80	188
Myiasis	..	..	1	..	1	..
Other Diseases	..	..	..	..	4	29
Total	..	332	1	1704	78	18974

REPORT ON THE MEDICAL AND SANITARY DIVISIONS PEMBA, FOR THE YEAR 1915.

General.—The year 1915 has seen more change in Medical Officers than any of the previous years. There were four changes, and a period in which there was no Medical Officer at all in the Island. With these constant changes, one would naturally have expected a great falling off in the number of patients, but on the contrary the attendance has increased, there having been 4,367 out-patients and 295 in-patients as compared with 3,513 and 286 in 1914. This is simply due to the fact that as years roll on, more and more people apply for relief to their sufferings at the Hospitals and Dispensaries provided by the Government.

The tabulated Returns of Diseases and Deaths for Hospital and Out-District Dispensaries are incorporated in Table I for the whole Protectorate.

The health of the Island has been fairly good. With the exception of whooping cough at the beginning of the year, and influenzal colds towards the last quarter, there have been no diseases of an epidemic character.

OFFICIALS.

Superior Staff.—The health of the European Officials has been fairly good throughout the year.

Dr. Waller, who took Medical charge of Pemba in the end of July, had to be relieved in the early part of November, and is still in Zanzibar.

Subordinate Staff.—The Officials have been taking their prophylactic doses of quinine regularly. There was one case of Blackwater fever, a Goan clerk at Mkoa i. I cannot say whether he was taking his quinine regularly, but I am inclined to think he was not.

The housing condition of the Officials in the town of Chake Chake is most unsatisfactory. It is utterly impossible for them to keep healthy as long as they live in such ill-ventilated and squalid quarters. If the Government is not prepared to build them quarters of the type built for the Weti clerks, I am certain that many of the land-owners at Chake Chake would willingly build houses for them, if the Government gave them long leases.

Prophylactic Quinine.—Altogether there were 3,092 doses of Quinine, as a prophylactic, administered in Pemba during the year.

It was distributed as follows:—

Chake Chake	1682
Weti	1156
Mkoani	254
	—
Total	3092
	—

Lepers.—There are three settlements in the Island:—

N'duni in the North	50	lepers
Pujini in the Centre	110	„
Kengeja in the South	44	„
	—	
Total	204	„
	—	

Supplies have been sent regularly to these different settlements and these unfortunate people seem to be fairly contented with their lot. They lead an open air life, and those who still retain part of their limbs amuse themselves in cultivating their little plots of ground. Regarding lepers who hold property in the Island, I think these properties should be sold as soon as they are definitely declared lepers, and they themselves sent to the Settlement, as it is a great temptation to them to leave the Settlement and roam about making arrangements concerning the picking of their clove crop, coconuts, etc.

J. S. DE SOUSA,
Medical Officer.

PUBLIC HEALTH DIVISION
ZANZIBAR AND PEMBA.

PUBLIC HEALTH DIVISION'S REPORT FOR 1916.

General.—The work of the Public Health Department has been encompassed in spite of additional work, and a somewhat depleted staff.

Major Skelton R.A.M.C. the M. O. H. being called up for active service, Mr. W. M. Aders Ph. D., F. Z. S. was appointed to the new post of Veterinary Zoologist, and was absent on leave for four months.

Mr. Lachand Bhaichand, clerk and store-keeper, (as Quarter Master) and Mr. S. A. S. Raval, vaccinator, have been on active service with the Zanzibar Porters and Ambulance Corps in British East Africa throughout the year.

A very satisfactory feature of this year's report is the fact that the death rate is the lowest ever recorded in Zanzibar town. I go back to the oldest records in this office, *viz* 1907.

There were no less than 231 fewer deaths than in the preceding year. What is still the disturbing factor of the vital statistics, is the mortality between the ages of 21 and 50.

The drop in the infantile death rate is worthy of note, there being a reduction of 1/3 the number of deaths under one year.

It is pleasing to record that the Zanzibar Protectorate has for two years been free from small-pox, although a few cases which occurred on H. M. S. "Kinfauns Castle" and were contracted in Bombay have been treated in the Infectious Diseases Hospital.

Special reports dealing with (1.) Human Filariasis, (2.) Trypanosomiasis in Cattle are incorporated.

The inauguration of an Opium Decree, a much needed measure has entailed more analytical work on this department.

On the return of the Senior Medical Officer I was asked by the Government to do a tour in Pemba, a report of which is included under special reports.

The usual course of Health Lectures given by the Medical Officer of Health and Dr. Aders was well attended by the Health Office Staff, Sisters from the French Mission, teachers and senior students of the Government School, and members of the University Mission Staff.

SANITATION.

The Government is contemplating the inauguration of an efficient system of conservancy and a circular was sent to all Europeans to ascertain how many of them would support it.

After the departure of the Gwalioris from Chukwani, the open air cement tanks, where rain water would collect, were filled in with

sand and lime to a depth of a few inches, to prevent mosquitoes from breeding. This it is hoped will make that area a more desirable camping ground in future.

Analysis of several well waters in the town of Zanzibar was carried through, but the fact of a poorly equipped Chemical Laboratory made this work incomplete.

As far as the examinations went, it showed a low estimate of free Ammonia and a high figure for Albuminoid Ammonia. Chlorine and hardness were abnormal, due probably to contamination by sea water or solution out of the coral rock. One would have expected a high figure for free Ammonia owing to the many cesspools in the town some of which are near wells, evidently the geological formation (there being no rock) allows of direct downward filtration without lateral spread.

OPIUM.

The Abuse of Opiates Prevention Decree came in force on 31st July, 1915, and has already to a great extent controlled the consumption of this drug. One of the provisions of this decree is the appointment of an Opium Board consisting of the Principal Medical Officer, the District Commissioner and the Medical Officer of Health.

The variety of ways in which opium and other narcotic drugs are made up and used by the Indian population, who are the chief consumers, makes it somewhat difficult to separate them by analysis. However two or three convictions have been obtained.

VITAL STATISTICS.

BIRTHS 1915.

The number of births registered in the Town of Zanzibar during the year 1915.

Males	...	...	...	...	167
Females	...	...	...	...	165
				—	332
Still-born	...	...	...	...	29
				—	361

Nationality of births:—

Swahilis	28	Ithnasheris	Khojas	38
Arabs	22	Memons		11
Manyema	1	Mohamedan Indians		6
Mnyamwezi	...	Bohoras		16
Nyasa	...	Banyans		28
Kavirondo	...	Turks		...
Masai	...	Parsees		7
Barawa	...	Persians		...
Somali	...	Goans		19
Gazijas	2	European Portuguese		1
Baluchi	...	„	Germans	...
Washiris	4	„	British	2
Ismaili Khojas	141	All Others		6

The total number of births registered in the Island of Zanzibar since 1910 is as follows:—

Districts	1915	1914	1913	1912	1911	1910
Town Districts	332	401	576	518	580	378
Mkokotoni District	1023	511	634	580	640	529
Chwaka District	426	245	287	251	348	387
Mwera District	458	190	253	186	246	273
Total	2239	1347	1750	1535	1814	1567

DEATHS.

The number of deaths registered in Town during the year 1915 was:—

Males	...	...	...	...	481	
Females	...	...	...	...	474	
					—	955
Walezo Leper and Poor Asylums						53
Total						1008

RETURN OF GENERAL CAUSES OF DEATHS.

Diseases	Males	Females	Total
<i>(a) INFECTIOUS DISEASES.</i>			
Beri-Beri	1	...	1
Bubonic Plague	1	1	2
Dysentery	1	5	6
Erysipelas	...	2	2
Gonorrhœal Rheumatism	2	...	2
Pneumonia	11	4	15
Small-pox	1	...	1
Syphilis Congenital	1	...	1
,, Secondary	2	...	2
Tetanus	1	...	1
Tuberculosis	89	69	158
Whooping Cough	...	1	1
<i>(b) GENERAL DISEASES.</i>			
Anæmia	41	48	89
,, Pernicious	2	...	2
Blackwater Fever	2	...	2
Diabetes Mellitus	1	1	2
Fever (Unclassified)	2	1	3
Malarial Fever	53	39	92
Pellagra	1	...	1

RETURN OF GENERAL CAUSES OF DEATHS.—*Continued.*

Diseases	Males	Females	Total
<i>(c) LOCAL DISEASES.</i>			
<i>(1) Diseases of the Nervous System.</i>			
Apoplexy ...	...	1	1
Cerebral Concussion ...	1	...	1
“ Haemorrhage ...	2	2	4
Dementia ...	14	23	37
Eclampsia (Convulsions, fits) ...	16	21	37
Epilepsy ...	2	2	4
Hemiplegia ...	...	1	1
Meningitis ...	2	1	3
Paralysis ...	11	22	33
Sunstroke ...	1	...	1
<i>(2) Diseases of the Circulatory System.</i>			
Angina ...	...	1	1
Cardiac Failure ...	1	...	1
Congenital Heart Diseases ...	...	1	1
Endocarditis ...	2	3	5
Fatty Degeneration of Heart ...	...	1	1
Heart Diseases ...	3	...	3
<i>(3) Respiratory System.</i>			
Abscess of Lung ...	1	...	1
Asthma ...	8	4	12
Bronchitis ...	32	37	69
Broncho-Pneumonia ...	7	...	7
Hæmoptysis ...	1	...	1
Laryngitis ...	1	...	1
Pleurisy ...	...	1	1
<i>(4) Digestive System.</i>			
Ascites ...	1	...	1
Cancer of Stomach ...	...	1	1
Cirrhosis ...	1	...	1
Diarrhoea ...	31	32	63
General Debility ...	52	107	159
Hepatitis ...	3	...	3
Hernia Strangulated ...	3	...	3
Intussusception ...	1	...	1
Jaundice ...	6	3	9
Peritonitis ...	1	...	1
<i>(5) Urinary System.</i>			
Bright's Disease ...	2	1	3
Cystitis Chronic ...	1	...	1
Nephritis ...	8	2	10
<i>(6) Generative System.</i>			
(Male Organs)			
Abscess of Scrotum ...	1	...	1
Orchitis ...	8	...	8

RETURN OF GENERAL CAUSES OF DEATHS.—*Continued.*

Diseases	Males	Females	Total
(Female Organs)			
Abortion	...	1	1
Cardiac Failure after delivery	...	1	1
Puerperal Septicæmia	...	4	4
(7) Diseases of the Organs of Locomotion.			
Rheumatism	12	16	28
Spinal Caries	1	...	1
(8) Diseases of the Skin.			
Carbuncle	1	...	1
Ulceration of the legs	...	1	1
(d) INJURIES.			
Asphyxia in cesspit	1	...	1
Burns (extensive)...	3	3	6
Cuts Head and Neck	1	...	1
„ Multiple	...	1	1
Fracture of Arm	...	1	1
Fracture of Skull	2	...	2
„ of Vault	1	...	1
„ of Wrist	2	...	2
Opium Poisoning (Deliberate)	1	1	2
Rheumatism Septic Poisoning	...	1	1
Rifle Shot Abdomen	2	...	2
Shot Under Martial Law	1	...	1
Starvation	1	1	2
Hanging (Under Martial Law)	1	...	1
Suffocation by Drowning	1	...	1
„ by Fall of Wall	1	...	1
„ by Rice Impaction	1	...	1
Suicide by Gun Shot	1	...	1
„ by Strangulation	1	1	2
(e) TUMOURS.			
Sarcoma	1	1	2
(f) PARASITES (Nematoda)			
Anchylostomiasis	8	3	11
Filariasis	1	...	1

Ages of the Deceased in Town:—

Under one year,		82
1 to 5 years,	46	
6 „ 10 „	19	
11 „ 20 „	45	
21 „ 30 „	124	
31 „ 40 „	204	
41 „ 50 „	148	
51 „ 60 „	80	
61 „ 70 „	61	
Over 70	141	
Unknown	5	

Nationalities of the deceased:—

Swahilis	519
Arabs	49
Manyemas	1
Mnyamwezis	3
Nyassas	5
Kavirondos	1
Kikuyus	2
Somalis	4
Gazijas	68
Baluchis	7
Washiris	60
Ismaili Khojas	76
Ithnasheris „	38
Memons	17
Mohamedan (Indians)	40
Bohoras	14
Banyans	33
Persian	1
Parsees	2
Goans	6
European British	1
Other Castes	8
	— 955

Total number of deaths for the whole Island by Districts.

Districts	1915	1914	1913	1912	1911	1910
Town Districts						
Mkokotoni District	1008	1239	1022	1288	1374	1363
Chwaka District	1005	801	889	1116	1258	1029
Mwera District	378	299	328	782	459	402
Total ...	829	721	766	1071	740	740
Total ...	3220	3060	3000	4255	3830	3534

Infantile Mortality.—Deaths amongst infants in the town districts numbered 82 (41 males and 41 females).

Of these 22 were Ismaili Khojahs, 11 Banyans, 10 Swahilis, 8 Arabs, 8 Ithenashiri Khojahs, 7 Bohoras.

The principal causes of death are registered as Bronchitis 27, Convulsions 19, Debility 18, Broncho-pneumonia 5, Malaria 3.

ZYMOTIC DISEASES.

PLAQUE.

There were two cases of plague during the year, one occurred in January and the other in March. The former was reported after death while the latter died in the Government Hospital, in both cases the diagnosis was obtained after death.

Preventive Measures.—There were only four plague infected rats found during the year, and these in the month of January, out of a total of 49,095 collected.

Rats collected at various collecting Stations during 1915.

Months	Mwembe Ladu	Mlandege	Darajani	Office	Total
January	153	247	238	3078	3716
February	139	211	221	3638	3209
March	240	189	297	3026	3752
April	249	11	332	2960	3552
May	265	153	325	3002	3745
June	256	265	405	3119	4045
July	300	244	537	3445	4526
August	298	195	568	3731	4793
September	296	261	807	3273	4637
October	239	212	570	3377	4398
November	284	183	629	3205	4301
December	266	110	556	3489	4421
Total	2,985	2,281	5,486	38,343	49,095

Varieties of Rats and Particulars of rats infected with Rat plague during 1915.

Months	Epimys Norvegicus (Brown rats)	Mus Rattus (Black rats)		Mus Alexa- ndrinus (Grey rats)		Musk rats		Bandi- coots		White rats		Total		
	Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected
January	1657	1	846	2	948	1	262	...	2	...	1	...	3716	4
February	1386	...	750	...	824	...	249	...	...	...	...	...	3209	...
March	1505	...	836	...	1109	...	302	...	...	...	...	...	3752	...
April	1321	...	839	...	1071	...	318	...	1	...	2	...	3552	...
May	1399	...	927	...	1146	...	372	...	1	...	...	...	3745	...
June	1522	...	1073	...	1142	...	308	...	...	...	...	...	4045	...
July	1804	...	1161	...	1247	...	314	...	...	...	...	...	4526	...
August	2002	...	1302	...	1189	...	300	...	...	...	...	...	4793	...
September	1841	...	1228	...	1246	...	321	...	...	...	1	...	4637	...
October	1685	...	1197	...	1249	...	267	...	...	...	...	...	4398	...
November	1648	...	1136	...	1254	...	261	...	2	...	...	...	4301	...
December	1666	...	1123	...	1387	...	295	...	...	...	...	...	4421	...
	19,436	1	12,418	2	13,762	1	3,469	...	6	...	4	...	49,095	4

SMALL-POX.

No case of Small-pox originating within the Protectorate has been reported for the last two years. The one fatality recorded was of a patient landed from a passing mail steamer in the Infectious Diseases Hospital.

Preventive Measures.

Number and Nationality of persons vaccinated during 1915.

		Eu-ro-pean	Goan	Indian	Arab	Swahili	Gazija	Shihiri	Total
January	4	3	89	...	...	96
February	3	4	55	...	...	62
March	12	2	54	...	...	68
April	1	3	49	...	...	53
May	2	4	34	1	...	41
June	3	4	41	...	1	49
July	2	3	62	...	...	67
August	7	5	230	...	20	262
September	16	444	...	...	460
October	6	15	132	...	...	153
November	2	7	178	...	...	179
December	3	4	78	...	...	85
Total	45	70	1,438	...	21	1,575

MOSQUITO BORNE DISEASES.

From the special report on Filariasis, it will be seen that this disease is very widespread.

It is only to be expected that this would be so, as every native hut in the native town of Ngambo has its open cesspit inside.

An encouraging fact is the large drop in the malarial death rate in the town, a decrease of over a third from that of the previous year, this being evidence of good work accomplished by the Chief Sanitary Inspector and his Mosquito Brigade. The deaths from Malaria numbered 92 as against 145 for 1914.

Preventive Measures.—The regular inspection of premises, clearing of heavy scrub, oiling of pools, etc, and some minor drainage works were carried out.

Of 59,928 inspections larvae were found on 1199 occasions (Stegomyia 794, Culicines 242, Anophelines 163).

TOWN SANITATION.

The routine inspections of premises, shops, dairies, stables, drains, etc. for structural faults, nuisances, etc. have been carried out, and notices served when necessary.

The insanitary condition of *Cow-sheds* throughout the town is serious. All milk cows are of necessity entirely stall fed as once they leave the town precincts they are exposed to the tick borne infection of East Coast Fever on all pasture land; but the housing of some 500 head of milk cows within the closely built town area raises difficult problems connected with ventilation, drainage and water supply of cow sheds.

Refuse Destructor.—51,559 cart loads of rubbish were dealt with during the year. A daily average of some 140 loads.

Port Sanitary service returns for 1915.

Months	No. of steamers	Particulars of steamers						Particulars of dhows						Total No. of passengers	
		National- ity	Pratique				No. of dhows	National- ity	Pratique						
			British	Foreign	Full	Restricted			British	Foreign	Full	Restricted	No. of passengers		
January	...	20	18	2	20	...	216	5	1	4	5	...	21	237	
February	...	15	14	1	15	...	395	16	2	14	15	...	38	433	
March	...	19	16	3	16	3*	602	41	3	38	41	...	202	804	
April	...	25	22	3	25	...	489	2	2	...	2	...	...	489
May	...	17	15	2	16	1	306	...	...	...	...	...	...	306
June	...	15	12	3	15	...	464	...	...	...	...	...	...	464
July	...	11	10	1	11	...	377	...	...	...	...	...	...	377
August	...	16	13	3	16	...	212	...	...	...	...	...	...	212
September	...	16	14	2	16	...	244	...	...	...	...	...	...	244
October	...	16	12	4	16	...	367	...	...	...	...	...	...	367
November	...	13	10	3	13	...	285	...	...	...	...	...	...	285
December	...	16	14	2	16	...	749	...	...	...	...	...	...	749
Total	...	199	170	29	195	4	4,706	64	8	56	64	...	261	4,977	

* (1) H. M. T. S. "Kinfauns Castle" one case Small-pox and eight contacts.

(2) S. S. "Pundua" case of Small-pox on voyage from Bombay 98 passengers for Zanzibar were quarantined.

(3) H. M. T. S. "Sofala" from Bombay infected with Small-pox remained in quarantine.

† S. S. "Varela" from Bombay case of Small-pox on voyage, 126 deck passengers for Zanzibar were quarantined.

INFECTIOUS DISEASES HOSPITAL, GULIONI.

The following table shows the admissions to the Hospital during the year 1915.

Diseases	Remaining from 1914	Admitted during 1915	Total	Died	Discharged	Remaining for 1916	Remarks.
Small-pox	...	3	3	1	2	...	
Measles	...	1	1	...	1	...	
Leprosy	...	1	1	...	1	...	Sent to Walezo Leper Asylum.
Malarial Fever	...	1	1	...	1	...	
Beri-beri	...	1	1	1	...	...
Anæmia	...	1	1	1	...	...	From Government Hospital.
Chicken-pox	...	3	3	...	3	...	
Phthisis	...	1	1	...	...	1	
Total	...	12	12	3	8	1	
Plague Contacts	...	60	60	...	60	...	
Small-pox ,,	...	9	9	...	9	...	
Grand Total	...	81	81	3	77	1	

SHOWING THE PARTICULARS OF LEPERS AT WALEZO
LEPER ASYLUM.

Particulars.		Males.	Females.	Total.
Numbers of Lepers on 1st January, 1915	...	...	43	56
Lepers admitted 1915	...	9	8	17
sent to Pemba	...	1	1	2
escaped	...	2	4	6
died	...	7	2	9
remaining 31st December, 1915	...	40	59	99

SHOWING THE PARTICULARS OF POOR HOUSE
AT WALEZO.

Particulars.		Males.	Females.	Total.
Number of patients remaining under treatment 1914	..	25	15	40
„ „ „ admitted 1915	...	41	24	65
„ „ „ discharged 1915	...	14	10	24
„ „ „ died 1915	...	29	15	44
„ „ „ remaining under treatment on 31st Dec., 1915	...	23	14	37

BACTERIOLOGICAL AND CHEMICAL DEPARTMENT.

The amount of material examined during the year was, if anything, more than in any previous year, although the number of specimens examined is put down as 1750, more than 50 short of last year.

This number does not include work done in the Chemical Laboratory, where various analyses of well waters, material seized by the Custom Authorities and soils were done.

The Laboratory being poorly equipped in the way of apparatus and chemicals one had to improvise and to make solutions for testing. A method of staining thick blood films for diagnosis of small infections of malaria, namely, keeping the film for 12 hours and then staining with Giemsa without fixing, has been improved upon.

The thick film is put for 5 minutes into a fixing solution of Alcohol, Chloroform, and Glacial Acetic Acid, and stained by Giemsa's method. The advantage of this method being rapidity and the showing up only of protozoal organisms and white blood cells, the reds failing to take up any stain whatever, and artifacts are reduced to a minimum.

There are several specimens of urinary Bilharziosis and one of the rectal form.

Malaria in all its forms was present in 10.2% of films. Mostly of the pernicious type.

Tubercle Bacilli 26%, much the same as last year.

Ankylostomiasis 50%.

A small epidemic of Chicken Cholera broke out in a yard near the Health Laboratories.

This was investigated and the causal organism found, sub-inoculations were undertaken, typical p.m. findings were seen in autopsy of guinea pigs, and the organisms in pure culture recovered.

Pathological specimens of interest examined were:—

1. *Hymenolepis Muris* encysted on the under surface of the liver of rat.

2. *Diplogonoporus* specimen from the biliary ducts of the liver of a goat. Individual worms measured about 2 foot, and the heads were in the ultimate ramifications of the biliary system, the method of obtaining the specimens intact was by placing the liver in normal saline. Heads with four circular suckers.

3. A flat worm of eight segments and head with six hooklets (cats claws) encysted on the surface of spleen of a goat.

Month.		Blood Films	Sputa	Faeces	Uries	Smears	Nasal Scrapings	Media & Stains	Culture Inoculations	Analysis	Rat Slides (infected)	Total
January	...	29	2	31	14	3	3	3	3	1	4	84
February	...	40	6	23	21	10	2	4	7	4	...	117
March	...	16	5	13	17	2	2	1	2	2	...	60
April	...	15	12	21	12	2	1	3	6	...	...	72
May	...	105	8	31	10	3	3	3	3	...	...	161
June	...	118	2	34	2	13	...	2	...	1	...	172
July	...	113	4	17	7	16	...	5	4	2	...	168
August	...	64	13	11	7	5	1	6	4	...	...	111
Setember	...	46	5	37	4	1	...	3	...	13	...	109
October	...	175	21	45	10	9	1	3	10	3	...	277
November	...	103	11	56	8	11	4	5	9	15	...	222
December	...	63	10	64	10	21	3	5	7	14	...	197
Total	...	887	99	383	122	94	14	43	52	55	4	1,753

PEMBA.

The routine work of the Sanitary Department has been carried out assiduously, *viz*; clearing and sweeping the streets and markets of Weti, Chake-Chake, Mkoani and Jambangombe, the kerosining of swamps and cess-pools, removing undergrowth round these Stations, and the regular inspection of premises for the prevention of mosquito breeding accumulations.

Total Births and Deaths as Registered.

During	1915	1914	1913	1912	1911
Births	889	822	1208	392	532
Deaths	1178	1042	1221	1013	1005

The total number of persons vaccinated was—1790.

The number of Lepers in the three settlements, Nduni, Kengeja and Mpuzini varied from 227 to 204 during the different months throughout the year.

Malaria.—Anopheline mosquitoes were found both in Weti and Chake Chake Prisons during a visit of inspection: their close proximity to Europeans' dwellings constitutes a danger to residents.

In the Chake Chake Government School a single examination of boys of 9 to 13 years of age revealed 16 Indian children with greatly enlarged spleens; malarial parasites were found in blood films of 25% of these. It was noted that neither Arab nor Swahili boys exhibited palpable enlargement of spleen.

FINANCIAL.

The sanctioned Public Health Department Budget for the year 1915 was Rs. 198,783 of which Rs. 182,646-07 cts. were spent leaving a balance of Rs. 16,136-93 cts.

EXPENDITURE.

Particulars of votes	Estimate		Actual Expenditure				
	Rs.	£	Rs.	cts.	£	s.	d.
Personal Emoluments,	122,897	8,193	122,464	22	8,164	5	7
Under this heading are included the salaries and duty allowances granted, of the Medical Officers of Health, Veterinary Zoologist, Sub-Assistant Surgeons, Sanitary Inspectors, Inoculator, Vaccinators, Rat Trappers and Dissector, Mosquito Inspectors, Disinfecting Engineer, Clerks, Care takers, Scavengers, etc.							
Other Charges,	75,886	5,059	60,181	85	4,012	3	3
Under this heading are included the passages and travelling allowances, Suppression of infectious Diseases, Quarantine Station, Upkeep of Laboratory, Museum, Cattle Quarantine Station, Slaughter House, Markets, Dhobi Station, Mweinbe-Ladu Grave-yard, Leper Asylums, Poor House, Motor Boat, Motor Cycle, Purchase of Disinfectants, Drugs and Dressings, Vaccines, Serums, Sanitary Appliances, Furniture, Uniforms, etc.							

REVENUE.

The total amount of Revenue collected during the year was Rs. 1,963 in which is included the Quarantine Revenue, Sale of Sanitary Appliances, Experimental Animals, Infectious Diseases Hospital Fees, etc.

A. G. CARMENT,
Acting Medical Officer Health.

SPECIAL REPORTS.

1. FILARIASIS (MICROFILARIA NOCTURNA.)

In the Health Report for 1913. R. Howard, M. A., M. D., B. CH., (Oxon) supplied a short report on Filariasis, and from his findings concluded an infection rate of something over 21% of the patients examined in his Hospital at Mkunazini (Universities Mission).

Various reports were current as to the prevalence of Filariasis among natives and Indians living in the Protectorate.

With a view to getting some definite knowledge with regard to this disease, I decided to examine blood films from prisoners of the Central Gaol, and also from the patients in the Government Native Hospital.

It was believed that from these two institutions one could make a very fair estimate of the degree of infection of the population of the Protectorate, as those interned came from all over both Islands.

In all 150 blood films were taken between 8.30 and 9.30 p. m. and 58 films showed microfilaria or almost 39% a percentage nearly double that found by Dr. Howard.

No Indians in Hospital or Prison showed any infection, but as stated by Dr. Howard no microfilariae were found in cases showing marked elephantic symptoms.

A. G. CARMENT.
Acting Medical Officer Health.

2. TRYPANOSOMIASIS.

On 15th July, 1915, the Acting District Commissioner sent me a minute from the Acting Assistant District Commissioner of Mwera that the cattle were dying of a disease which in his opinion was East Coast Fever.

The Veterinary Zoologist being on leave I visited that district the same day and examined the carcases of two animals, there was nothing conclusive in the p. ms. but smears in one case showed trypanosomes.

For the next few days I visited Mwera to find a sick animal and after some difficulty at last found one, which showed the usual symptoms.

I was further informed that there was some sickness amongst a herd of Government bulls at Dunga, where they were housed in a large shed.

I found one animal in extremis and blood films from it showed abundant trypanosomes.

The blood sucking flies which were tormenting all the animals were *stomoxys calcitrans* and *nigra*.

Examination of films from many of the herd showed trypanosomes in varying degrees of infection.

A little calf in a neighbouring village had numerous trypanosomes in its blood.

It was at the instance of the Director of Agriculture, that I examined the cattle at Dunga (the majority of which came from Mkunduchi District), also cattle dying at Saateni (Mwera).

In all places trypanosomes were found in the blood of the animals, and I believe that at no time previously in recent years have so many cattle succumbed to trypanosomiasis.

On the 27th September, 1915, the Superintendent of the Government Stables informed me of the illness of a black bull and in blood films from this animal numerous trypanosomes were found.

Examinations, however, of blood films from other draught cattle, milch cows and buffaloes revealed no further infection in those Stables. Cases of trypanosomiasis have been reported from Zanzibar formerly by Dr. Spurrier c.m.g., Dr. Edington, and Dr. Aders (see his Economic Zoology Report for 1913,) but this outbreak is evidently the most serious ever experienced in Zanzibar. It is impossible to estimate the death rate in the Mwera District, but it may be taken as an index that the natives were alarmed at the number of cattle dying.

It is my opinion that more of the animals I saw infected might have died had they not been slaughtered or disposed of.

In my opinion the trypanosomes found resembled probably those found in films sent by Dr. Spurrier to Dr. P. H. Ross, Director of Laboratories East Africa in 1906 or thereabouts, and stated by him to be

of the brucei evansi type, although nothing very definite is known of the films, nor from what animals they were taken.

In all the films examined by me the trypanosomes were of the same type, having in most cases a free flagellum and some vacuolation of the protoplasm which also contained scattered granules; their length varying from 15 m. to 23.5 m. and average breadth of 2 microns, Actively motile, and in some cases traversing the field of microscope.

Inoculation experiments. *Guinea pigs* proved absolutely immune, 16 having from 2 to 10c. c. of citrated blood injected without effect.

Goats.—Showed trypanosomes on the 8th day and succumbed on the 45th and 58th day.

Dogs.—Showed trypanosomes on 4th and 8th days the former died in 9 days the latter in 25 days.

Monkey.—Inoculated and nothing happened. It was reinoculated about a month after and in 5 days trypanosomes were present in the blood.

Donkey.—Inoculated and showed trypanosomes in 26 days and died in 65 days.

No rise in temperature was observed in any of the experimental animals.

It is possible that trypanosomes may have been present earlier, because films were not taken regularly from the animals. It is interesting to note that when Dr. Aders returned we examined wet films and in addition I stained dried films and that in many cases even after careful search though we found nothing in wet films trypanosomes were easily demonstrated in stained specimens.

Points of interest in connection with this investigation are.

1. Three foci of infection in Mwera District (a) Saateni (b) Mwera Bridge (c) Dunga. A straight line drawn from Saateni on the west coast of Zanzibar town to Dunga in the centre of the island passes Mwera Bridge the intervening space being about 5 miles.

2. Insusceptibility of guinea pigs. Dr. Aders in 1913 had two deaths due to subinoculation of guinea pigs.

3. The occurrence of three simultaneous outbreaks which could hardly be connected by a vector.

4. Rapid emaciation and paralytic symptoms in inoculated animals, dog and donkey especially.

5. The death of the donkey would indicate the seriousness of an outbreak if a suitable vector was introduced into the Protectorate.

6. The anomaly of a heavily infected draught ox being in the Government Stables in close proximity to other cattle, horses, and donkeys, the presence of swarms of *stomoxys* and yet nothing happening. Evidently the very dubious isolation in a separate byre being sufficient to prevent even mechanical transmission.

Comparison of trypanosomes found in Zanzibar:—

Trypanosoma pecorum (Aders 1913).

From horse and cow identified by Sir David Bruce. Average length 13.4 microns. No free flagellum only a few cases.

Vector (tsetse) No tsetse ever found in Zanzibar.

Trypanosome (Edington 1911).

Belonging to pecorum group (Castellani and Chalmers) Average length 13.5 microns.

Trypanosoma (spec?) Average length 20 microns.

Although a film taken from subinoculated dog just before death showed many tadpole forms perhaps due to rapid multiplication of the organism. In the largest forms in the infected animals and in this subinoculated animal the free flagellum measured 1/5th the length of entire trypanosome. Vacuolation of the protoplasm was almost always present, the undulating membrane was well marked and the non flagellar end was often pointed.

In making the measurements films were fixed wet in Flemming's Solution, and then stained by Giemsa's method. This trypanosome may possibly be spread by *stomoxys calcitrans* or *nigra*. The comparatively large area of infection may be due to an infected animal getting into each district and the spread being mechanical owing to cattle being herded together.

Report on an infected bull in the Government Stables.

On 23rd September, 1913, I was informed by Mr. Hewett that there was a sick animal in the Stables which had been kept isolated for a few days. Blood films taken the same day revealed numerous trypanosomes.

Although Dr. Aders had in the year 1913 found cases of trypanosomiasis in the Government Stables and elsewhere, it was in view of the fact that cattle, goats and donkeys belonging to private individuals were to be interned in the Stables as, under the Dairies and Cowshed Decree, they had been refused licences to keep animals in their own cowsheds, that it was thought advisable to ascertain the nature of the disease and its extent so that private owners' cattle would be safeguarded.

I at once commenced a systematic examination of the bloods of all the cattle in the Government Stables, but there were no other sick animals and the blood films taken all proved negative.

Dr. Aders returned on 2nd October and together we continued blood examinations but no other case of trypanosomiasis was found.

Inoculation experiments were done by Dr. Aders, the animals used being Guinea-pigs, Goats, Dogs, Monkeys and Donkeys.

Guinea-pigs even when given large quantities of blood from infected animals 2 to 10 c. c. proved to be absolutely immune. In Dr. Aders' Report of 1913 on trypanosomiasis he had only three deaths among Guinea-pigs. Goats were all susceptible, and died of the disease.

Dogs were very susceptible and succumbed early to trypanosomiasis.

The Monkey was readily infected by subinoculation but unfortunately escaped, while harbouring many trypanosomes.

The donkey was inoculated with 20 c. c. from the original strain Government black ox, it became infected and died in 65 days.

Conclusions. Evidently the most casual isolation of one infected animal in proximity to healthy ones prevents spreading of this disease perhaps because the vector of the disease was not present.

2. On the other hand, out of a herd of some 14 Government bulls at Dunga, all were probably infected that many were so I found, but the cattle were suddenly removed before my examination of them all was completed. In this instance the transmission was possibly mechanical. It is not at all likely that every animal was suffering from the disease *de novo* because in some cases the trypanosomes were difficult to find. (Animals all kept in one banda).

3. Should the animals of private owners be housed in the Government Stables then there is a danger of overcrowding and the probability of mechanical transmission of the disease has to be considered, it being impossible to rid the Stables of blood sucking flies which would be the agents of transmission.

4. Under these circumstances, unless the infected animal is removed or destroyed I would not recommend that the animals of private owners be placed in the Government Stables.

A. G. CARMENT,
Acting Medical Officer of Health.

VETERINARY REPORT
FOR 1915.

VETERINARY DIVISION REPORT FOR 1915.

No cases of epizootic disease have occurred during the past year with the exception of an outbreak of *Typanosomiasis* in the Mwera District. No statistics concerning mortality and number of animals attacked are to hand, as I was absent on leave during the outbreak.

Slaughter House.—As stated in my last report, all meat is carefully examined and stamped with a Government seal.

It is proposed during the year 1916 to divide the meat into 2 classes:—

1. Prime	First Quality.
2.	Second Quality.

This latter will include a certain amount of fevered meat sold at a reduced price: it seems only right that the Public should know what they are buying and accordingly pay less. Fevered meat is in many cases fit for human consumption, its nutritive value only being lessened.

The building is still in a good condition. As the question of its removal to other quarters is under consideration, no improvements except a few minor repairs are contemplated.

The following table shows the number of stock examined:—

TABLE 1.

Stock	Killed	Rejected	Total condemned	Partially condemned
Oxen	1,783	...	...	227
Calves	31	...	...	3
Cows	31	...	...	17
Goats	9,797	...	...	2,120
Sheep	891	...	...	369
Camels	10	...	...	1
Buffaloes	1	...	...	...

It will be noticed that a large number of goats and sheep were partially rejected, this is owing to the fact that among those imported a large number suffered and succumbed to Pleuro-Pneumonia.

Note. 58 oxen were slaughtered free of charge, as some were the property of the Government, others of H. H. The Sultan.

Fees collected during the year for the use of the Slaughter House amounted to Rs. 4,469 and 52 cents.

IMPORTATION OF LIVE STOCK.

As will be seen from Table No. 2 there has been a marked increase of imported animals, owing to the presence of His Majesty's Ships in Zanzibar waters. On several occasions the Navy has been supplied with 5000 lbs. of meat at very short notice, necessitating the slaughter of 20 cattle. As the slaughter house was never intended to accomodate such numbers it reflects great credit on the local but-

chers and meat vendors; on no occasion have they failed to supply the Town or Navy.

No milch-cows have been imported during the year from Bombay, as the Indian Government prohibited their exportation after the outbreak of war.

TABLE 2.
ANIMALS IMPORTED DURING 1915.

Months	Cattle	Donkeys	Goats & Sheep	Cows	Calves	Camels
January	33	...	169	...	...	...
February	166	1	983	...	...	...
March	72	...	515	4	...	...
April	202	2	513	5	4	...
May	147	...	412	...	...	...
June	219	...	790	...	...	...
July	106	...	509	...	...	...
August	206	...	980	...	...	...
September	208	1	1118	...	...	5
October	204	...	1105	...	...	1
November	158	...	1106	...	...	1
December	131	...	601	...	...	...
Total	1,852	4	8,801	9	4	7

ANIMALS EXPORTED DURING 1915.

Table No. 3 shows the number of animals exported. All of them were destined for Pemba. A number of milch-cows were exported most of them locals, among them a few pure bred Indians. It is encouraging to note that the latter are finding their way to Pemba, the introduction of better breeds cannot fail eventually to improve the Pemba stock.

TABLE 3.
ANIMALS EXPORTED DURING 1915.

Months	Cows	Calves	Cattle	Donkeys	Goats & Sheep	Horses	Other animals Mules etc.
January	...	...	...	...	...	...	...
February	...	...	...	4	...	...	...
March	...	...	...	...	16	...	...
April	...	...	...	4	5	...	...
May	1	...	...	...	...	...	...
June	...	...	...	...	2	2	...
July	...	...	8	4	26	...	...
August	6	...	2	5	3	...	...
September	...	...	9	4	84	...	...
October	9	10	2	7	104	...	...
November	23	9	5	6	126	...	...
December	38	10	12	7	59	...	...
Total	77	29	38	41	425	2	...

DAIRIES AND COWSHEDS.

Inspections of these have been made from time to time and advice given to the Sanitary Inspectors, who are responsible for their cleanliness, etc. The whole question is still as unsatisfactory as it was in 1914. Various plans have been brought forward for the improvement of the local sheds and for the erection of an up-to-date Town dairy.

Certain dairies have been closed and others renovated, in my opinion a useless expenditure as nearly all should be permanently closed.

PIGADURI QUARANTINE PARK.

All animals arriving from any port are placed in quarantine at Pigaduri for varying periods.

Total number of oxen quarantined	...	1,855
Total number of sheep and goats quarantined...		8,801
Total number of camels quarantined	...	7

In one batch of cattle imported during 1915 Pleuro-Pneumonia made its appearance. Animals showing definite symptoms were at once isolated, certain portions of the carcases were condemned, the rest sent to the market for sale. All contacts were slaughtered in quarantine, thereby preventing any danger of the disease spreading on the island.

Pagaduri Quarantine Park has been of the utmost use and has fully justified its inauguration.

One new makuti banda has been built capable of housing 300 goats; owing to lack of funds a permanent shed could not be built.

The Station is badly in want of a dipping tank and a fly-proof cattle shed for Surra suspects, these two additions are essential, with them the quarantine station would be ideal, without them disaster may overtake us at any moment.

DEATH REPORT FOR 1915.

The following animals died during the year:—

Horses	...	...	5
Oxen	...	...	27
Cows	...	...	25
Calves	...	...	7
Sheep and Goats	...	...	42
Donkeys	...	...	13
Mule	...	...	1
Buffalo	...	...	1

Great difficulty was experienced in performing post-mortems as no suitable site was available. It is hoped that during 1916 an adequate mortuary will be erected either near the destructor or some other suitable place.

Nearly all deaths among the draught oxen were due to pneumonia, the majority of them succumbed during the months of May and June, the rainy seasons of the year. No cases of Trypanosomiasis were discovered.

Among the milch-cows one died of general Tuberculosis, another of Malignant Oedema.

A buffalo, the property of the Government, died of Typanosomiasis.

The majority of the imported goats and sheep succumbed to Pleuropneumonia; as pointed out in my former report this disease is common among goats imported from the mainland.

VETERINARY HOSPITAL.

The total number of cruelty cases treated was as follows:—

Donkeys	49	sent for medical treatment	
	39	„ „ „ „	after prosecution and fine.
	14	„ „ „ „	prosecution no fine.
Total	102		
Cattle	11	sent for medical treatment.	
	1	„ „ „ „	after prosecution and fine.
Horses	1	„ „ „ „	
	1	„ „ „ „	
Mules	2	„ „ „ „	
	2	„ „ „ „	

Note—The fines realised Rs. 222. Two Somalis were prosecuted for bringing cattle by Dhow with insufficient fodder and water they were fined Rs. 100.

VETERINARY GENERAL.

A few cases of Trypanosomiasis have been discovered from time to time mostly in the Town area and its immediate surroundings.

One buffalo was found to be infected in the Government Stables and after a somewhat protracted illness succumbed.

Our knowledge regarding local Trypanosomias has during the last year undoubtedly increased.

The Medical Officer of Health during my absence on leave discovered a certain number of cases, and since my return we have been working in conjunction on the question. Our results and those carried out in former years show that the local trypanosome is undoubtedly dimorphic. We have also come to the conclusion that owing to subinoculation into various experimental animals the strain may undergo changes in regard to its morphological characteristics.

As far as we can ascertain the mortality among the valuable and useful stock causes no alarm for the future. Several animals have recovered after a prolonged period of sickness.

The question still requires careful attention. A long series of experiments has been carried out, but owing to the lack of a suitable experimental station, our results have been delayed.

Two oxen and two buffaloes were sent to Mr. Montgomery, Veterinary Pathologist in British East Africa.

These animals were submitted to various tests with the following results:—

1. The experimentally proved immunity to Rinderpest of an indigenous ox bought at Mangapwani in 1911, and also of the buffaloes taken from the Sultan's herd, tended to show that Rinderpest must have occurred in Zanzibar within recent years.

2. The oxen were immune to East Coast Fever and so had evidently suffered from and survived that disease. There are as yet no definite data regarding the susceptibility of buffaloes to this disease.

Zanzibar evidence tends to indicate a resistance since all have unquestionably grazed on infected pastures.

3. The buffaloes were shown to be insusceptible to Babesia and Anaplasma, whilst on the other hand these were demonstrated in the blood of the oxen.

W. M. ADERS.
Veterinary Zoologist.

ECONOMIC ZOOLOGY
REPORT FOR
1915.

ECONOMIC ZOOLOGY.

SECTION 1.

ENTOMOLOGY IN RELATION TO PUBLIC HEALTH
AND MEDICINE.

ORDER DIPTERA (CULICIDAE).

During the year 1915 no new species of Anophelinae were found. The records of the various Culicidae larvae taken by the mosquito brigade are published in the Report of the Medical Officer of Health.

As published in my former report all Anophelinae bred from larvae captured in the town and its immediate surroundings proved to be *Anopheles costalis*.

A number of adults taken from native huts in various parts of the islands proved to be either *Stegomyia fasciata* or *Culex fatigans*.

In my former report the prevalence of *Stegomyia fasciata* was mentioned, but during the year 1915 large numbers of adult *Culex fatigans* have been captured in the N'Gambo District. As *C. fatigans* is now known to be an active carrier of *Microfilaria bancrofti* in Zanzibar, the question of its eradication has become as important as that of *A. costalis*.

During the year under review *Eretmopodites quinquevittatus* has become far commoner in the town, larvae are nearly always found in old shells containing water rich in vegetable matter. On two occasions specimens were found in an old tin in association with *Stegomyia fasciata*.

The following notes on the life-history of *Eretmopodites quinquevittatus* have been obtained.

Adult females (bred specimens) were caged, they refused to feed on human blood, but partook readily of banana. On males being introduced copulation took place at once. In two days time one female laid 35 eggs, all of which proved fertile. The first imago appeared on the 12th day, and all had hatched by the evening of the 15th.

The eggs were laid singly being of a dark brown colour. The larvae of *Eretmopodites quinquevittatus* are easily recognisable from other forms by their long narrow abdomen and thorax, short siphon, and their peculiar habit of gliding through the water and not wriggling as a means of progression.

By this habit they are easily singled out from a mixed infection. The pupae are characterised by their white colour, and by the abdominal segments, which, instead of being coiled up towards the thorax hang vertically downwards. Conspicuous tufts of bristles attached to the anal fins are recognisable with the naked eye.

Stegomyia sugens, Wied.—Has been taken on one occasion only in the town, breeding in a garden puddle. Several lots of larvae have been brought in from various out districts.

The following mosquitoes have been taken in the town during 1915:—

Stegomyia fasciata.—Abundant everywhere.

Stegomyia sugens.—A rare form.

Culex fatigans.—Abundant everywhere especially in cess-pools and water rich in decaying vegetation. Seldom taken in conjunction with *Stegomyia fasciata*.

Anopheles costalis.—The only anopheline captured in the town. Nearly always found in large shallow collections of water such as garden tanks, puddles in gardens, and on one occasion they were found breeding in a canoe. Generally only taken during the rains and for a short time afterwards.

Culex tigripes.—An occasional visitor. One could wish that this useful species was commoner. The larvae are extremely rapacious devouring large numbers of *Stegomyia fasciata* and *Culex fatigans*.

Eretmopodites quinquevittatus.—Is becoming quite a common form, as mentioned before, generally found breeding in old snail shells.

Toxorhynchites brevipalpis.—This mosquito has proved to be very ubiquitous, nearly every mango tree containing holes harbouring from 3 to 8 larvæ.

As mentioned in my former report in captivity they are predacious on larvæ of *A. costalis*, *S. fasciata*, and *C. fatigans*. On no occasion have I found these larvæ under natural conditions in association with *Toxorhynchites brevipalpis*, therefore from a beneficial point of view they are not of much value.

The following breeding experiments were undertaken with *Toxorhynchites brevipalpis*:—

Females could not be induced to feed on human blood, but partook greedily of banana and date. One female (bred) laid 31 eggs singly, they are whitish in colour decorated with a tessellated pattern, one pole carries a bunch of filaments evidently acting as a float. The larvae on first hatching are white in colour, in two days they become red and remain so until the pupal stage is reached. The length of time passed in the larval stage varies with the amount of food procurable. I have seen adult larvae devour 10 full grown *C. fatigans* larvae in an hour, besides killing a number of others. Generally speaking with a generous food supply, the larval stage lasts from 10 to 12 days. Pupal stage 3 days.

The mosquito fauna of Zanzibar and Pemba comprises the following forms:—

<i>Anopheles costalis</i> , Lw.	<i>Culex univittatus</i> , Theo.
<i>Anopheles funestus</i> , Giles.	<i>Culex sitiens</i> , Wied.
<i>Anopheles mauritianus</i> , Gp.	<i>Culex duttoni</i> , Theo.
<i>Stegomyia fasciata</i> , F.	<i>Culiciomyia nebulosa</i> , Theo.
<i>Stegomyia sugens</i> , Wied.	<i>Ochlerotatus pembaensis</i> , Theo.
<i>Culex fatigans</i> , Wied.	<i>Ochlerotatus durbanensis</i> , Theo.
<i>Culex invidiosus</i> , Theo.	<i>Ochlerotatus nigeriensis</i> , Theo.
<i>Culex tigripes</i> , Grp.	<i>Ochlerotatus longipalpis</i> Grumb.
<i>Culex guari</i> , Blanch.	<i>Ochlerotatus irritans</i> , Theo.
<i>Culex laurenti</i> , Newst.	<i>Ochlerotatus albocephalus</i> , Theo.
<i>Culex decens</i> , Theo.	<i>Banksinella lineatopennis</i> , Lud.
 	<i>Cyathomyia fusca</i> , Theo.
<i>Eretmopodites quinquevittatus</i>	<i>Mimomyia mimomyia-formis</i> , Newst.
<i>Mansonoides uniformis</i> , Theo.	<i>Mucidus mucidus</i> , Karsch.
<i>Toxorhynchites brevipalpis</i> , Theo.	<i>Taeniorhynchus fuscopennatus</i> , Theo.

MUSCIDIÆ.

The following flies have been taken in addition to those mentioned in my previous reports:—

Pycnosoma inclinatum, Walk.

Lucilia serricata, Mg.

SECTION II.

ENTOMOLOGY IN RELATION TO VETERINARY SCIENCE
ACARINA.

No new ticks have been recorded during the year 1915.

Rhipicephalus pulchellus.—A common form on imported stock from British East Africa. Replete females have been collected on several occasions from imported cattle. This tick, probably due to climatic conditions, has been unable to acclimatise itself on the island. I have never taken a specimen from local stock.

DIPTERA.

No new blood sucking flies have been captured during the year under review. A number of non-blood sucking flies have been taken feeding in conjunction with *Stomoxys calcitrans* and *nigra*, namely *Musca domestica*, *Pycnosoma putorium*, and *Biomyia tempestatum*. These flies generally alight in close proximity to a feeding *Stomoxys* and the moment the latter moves there is a scramble among the non bloodsuckers to lap up the remaining droplet of blood. It now becomes a question if non-blood-sucking flies are not able to mechanically transmit through the agency of wounds and sores various blood parasites.

Oestrus ovis.—One of the commonest forms of the island, nearly every goat's head examined at the slaughter house revealed a number of larvae in all stages of development.

SECTION III.

ENTOMOLOGY IN RELATION TO AGRICULTURE.

During the year 1915 there has been no serious outbreak of any insect pests. Those mentioned in my former report have been more or less prevalent during the whole season.

Coconuts Rhinoceros Beetle.—(*Oryctes monoceros* and *boas*).

Traps which were to have been made in 1914 have not been constructed. Until an organised campaign of systematic trapping is started nothing can be done to keep the beetle under control. Numerous Government plantations were visited in conjunction with the Assistant Director of Agriculture, all those containing young trees aged from $2\frac{1}{2}$ to 3 years old were found to be heavily infected.

No further work has been undertaken with the fungus *Metarrhizium anisploae*. Mr. Anderson (Entomologist of the British East

Africa Government) inspected with me several Government plantations. After carefully considering the various methods of eradication he proposed sprinkling dry earth or sand in the crowns of all young trees, as this might act as a deterrent to the adult beetle.

Clove trees.—As in former years a certain number of trees have succumbed, no further light has been thrown on this problem. In spite of most careful search no fungi or insect pests have been found. The Assistant Director of Agriculture agrees with me, that in all probability the cause of death is some physiological factor.

Citrus Trees.—The most prevalent pests both on young and old trees are various Coccidae. I append a list of those identified:—

Icerya seychellarum.
Icerya purchasi.
Pseudococcus citri.
Lecanium viride.
Aspidiotus trilobitiformis.
Lepidosaphes citricola.
Mytilaspis citricola.
Mytilaspis beckii.
Dactylopius obtusus.

Spraying with fish-oil has given fairly good results, especially on young trees. As the Citrus industry of Zanzibar is not of any great importance and most of the plantations of small dimensions, fumigation with Hydrocyanic Acid Gas has not been attempted.

The following insects injurious to economic plants have been identified during the year:—

DIPTERA.

<i>Dacus brevistylus</i> , Bezzi.	Larvae in <i>varus</i> <i>Cucurbitaceae</i> .
<i>Dacus vertebratus</i> , Bezzi.	" " "
<i>Dacus punctatifrons</i> , Bezzi.	" " "
<i>Ceratitis rosa</i> , Karsch.	Bred from <i>Soursop</i> .

LEPIDOPTERA.

<i>Chilo suppressalis</i> , Wlk.	Larvae feeding on maize cobs and tunnelling in main stalk.
<i>Duomitus capensis</i> , Baker.	Larvae tunnelling in castor oil tree.
<i>Miresa milanostica</i> , Baker.	Larvae in large numbers feeding on leaves of <i>Terminalia catappa</i> (African Almond).

COLEOPTERA.

<i>Tenebroides mauritanicus</i> , L.	In various stored grains.
<i>Cossonus suturalis</i> , Boh.	In stored sweet potato tubers.
<i>Necrobia rufipes</i> , de Geer.	Adults and larvae feeding on stored Copra. In many store houses these insects had caused considerable damage.

COCCIDAE.

<i>Asterolecanum bambusae</i> , Bd.	On bamboo.
<i>Pseudococcus perniciosus</i> , Newst.	On various <i>Cucurbitaceae</i> .
<i>Aspidiotus ficus</i> , Ashm.	On rose stalks.

<i>Pseudococcus virgatus</i> , Ckll.	On cotton.
<i>Ceronema africana</i> , Maeifie.	On leguminous wild creeper.
<i>Ischnaspis longirostris</i> , Sign.	On coffee.
<i>Ceroplastes floridensis</i> , Crostock.	On avocardio pear.
<i>Lecanium hesperidum</i> , L.	On indigenous fern.
<i>Pseudococcus crotonis</i>	On husk of coconut.
<i>Aspidiotus destructor</i> , Sign.	" " "
<i>Aspidiotus cyanophyili</i> , Sign.	" " "
<i>Aspidiotus lataniae</i> , Sign.	" " "
<i>Hemichionaspis minor</i> , Mask.	" " "
<i>Pulvinaria antigoni</i> , Ckll.	On chillies and <i>Luffa actangulata</i> .
<i>Aspidiotus dictyospermi</i> , Morg.	On stem of seedling mango.
<i>Diaspis pentagona</i> , Targ.	On <i>Hibiscus sabdarriffa</i> .

Fortunately only very few coconut trees have been found infested with *Aspidiotus perniciosus*.

SECTION IV.

GENERAL ZOOLOGY.

The following birds have been identified:—

Orange Yellow Weaver, Finch	<i>Hyphantornis aureoflarus</i>
Bronze Cuckoo	<i>Chrysococcyx cupreus</i>
Persian Bee Eater	<i>Merops persicus</i> .
White eyed browed Lark-headed Cuckoo	<i>Centropus superciliosus</i>
Long Tailed Roller	<i>Coracias caudatus</i>
Kersten's Weaver Finch	<i>Symplectes kersteni</i>
Smith's Swallow.	<i>Hirundo Smithi</i>
Spotted Fly Catcher	<i>Muscicapa grisola</i>
Black Headed Green Heron	<i>Butorides atricapilla</i>
Half Collared Turtlē Dove	<i>Turtur semitorquata</i>
Black African Drongo	<i>Buchanga assimilis</i>
Paradise Fly Catcher	<i>Tersiphone cristata</i>
Naked Eyed Fly Catcher	<i>Batus molitor</i>
Spot Winged Dove	<i>Chalcopelia afra.</i>
Indian Pipit	<i>Anthus rufulus</i>
Zambesi Sun Bird	<i>Anthrothreptes zambesiana</i>
Weaver Finch	<i>Amblyospiza unicolor</i>
Spotted Mannikin	<i>Spermestes guttatus.</i>
Lesser Amadurade	<i>Estrilda minor</i>
Indian Crow	<i>Corvus splendens.</i>
Mozambique Nightjar	<i>Caprimulgus fossei</i>
Egyptian Kite	<i>Milvus aegypticus</i>
Sgnacco Heron	<i>Ardeola ralloides.</i>
Grey Headed Parrot	<i>Agapornis cana.</i>
Buff Backed Heron	<i>Bubulcus lucidus.</i>
Painted Quail	<i>Turnix lepurana</i>
Sanderling	<i>Calidris arenaria</i>
Greater Sandplover	<i>Octodromus geoffroyi</i>
Ringed Plover	<i>Egialitis hiaticola</i>

All these were examined for blood-parasites, the following were infected:—

Ardeola ralloides
Corvus splendens
Corous scapulatus

Trypanosomes (Stumpy forms)
 Microfilariae. (Heavy infection)
 Microfilariae.

The Museum of the Department has steadily increased, affording interest to various visitors. A large number of photographs and descriptive labels have been set up, being of great use for demonstrating the lectures. The primary object of the Museum is educational and is by no means intended to represent the complete fauna of the island.

During the year in conjunction with the Medical Officer of Health a series of lectures and demonstrations dealing with the chief insects harmful to man were given.

CONCLUSION.

Owing to my taking charge of the Veterinary Department under the Medical Officer of Health little time has been available for working at economic biological problems.

W. M. ADERS,

